



Southwest Center for Agricultural Health, Injury Prevention and Education

Summary Annual Report

September 30, 2013-September 29, 2014

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SECTION 1

Center Summary

The Southwest Center for Agricultural Health, Injury Prevention and Education (SW Ag Center) is a well-established center based at the University of Texas Health Northeast in Tyler, Texas. The SW Ag Center serves Public Health Region 6 which includes Arkansas, Louisiana, New Mexico, Oklahoma and Texas. The mission of the SW Ag Center is to *improve the safety and health of agricultural, forestry and fishing (AFF) workers*. This is accomplished through an integrated program of research, intervention, education and outreach activities that engage and leverage a network of strategic partners who represent the interests of a diverse worker population and a wide range of agricultural production in the region. Similarly, the Center's scope of work is organized around the theme "Building Strategic Partnerships to Improve Agricultural, Forestry and Fishing Worker Safety and Health". Four research projects are funded through the Center. Projects address (1) organic dust induced inflammatory responses in the lung; (2) neuromotor function and acute injury among adolescent Hispanic farmworkers; (3) social marketing to promote adoption of safe work practices among Vietnamese commercial fishermen in the Gulf of Mexico; and (4) respirator use among poultry house workers. The Center's feasibility program augments the research projects, supports mentorship relationships between senior and junior researchers and is responsive to emerging issues within AFF in the region. Six diverse, regionally representative feasibility studies were active in year three of this funding cycle. Outreach activities for year three include heat related illness presentations, an agricultural safety and health internship, a logging workgroup meeting and the creation of a collaborative YouTube channel. The Center evaluation program uses logic models, bi-annual progress charts and social network data to assess goal attainment and network growth.

Relevance

The SW Ag Center is uniquely positioned to address farming, ranching, commercial fishing, forestry and logging occupational safety and health within its service region through research projects, feasibility studies and outreach activities. The SW Ag Center has two funded projects related to poultry production, a substantial operation within the region. One project will help us understand how the lungs respond to organic dust and the other will educate poultry workers on use of appropriate personal protective equipment. Research projects also specifically address diverse regional worker groups, including Vietnamese fishermen and adolescent Hispanic farmworkers. The Center has a record of success working with special populations and producing culturally appropriate interventions in the language of the audience. Read more about the currently funded projects at <http://www.swagcenter.org/projectscurrent.asp>.



Feasibility studies allow the Center to investigate emerging issues or gaps in research or data. Studies active in year three address a wide variety of topics including: tractor seating for paraplegia, work-life characteristics of South Texas agricultural workers, organic farming risks in New Mexico, grain entrapment, youth development outcomes, and inflammatory agents in agricultural dust. Principal investigators from these studies are located in Oklahoma, New Mexico and Texas. Information about past and current feasibility studies is available at <http://www.swagcenter.org/projectsfeasibility.asp>.

Outreach activities address occupational safety and health across the broad industry through monthly safety messages delivered to 1200-2000 producers, educators and scientists; <http://www.swagcenter.org/resourcesmonthlyblasts.asp>. Monthly safety blasts are regularly reprinted in trade publications like the Texas Logger, sent to industry list serves (Arkansas Ag Science Teachers, Louisiana Extension) and shared on Facebook. The SW Ag Center builds the capacity for future professionals in agricultural safety and health through a collaborative internship. Educational resources are adapted and created to address current occupational issues. Heat illness prevention and logging safety and health were specifically addressed in year three. Additionally, the SW Ag Center collaborated with the other nine Ag Centers to create a joint YouTube channel in order to respond to advances in technology and the growing popularity of social media among AFF producers and educators (<http://www.youtube.com/user/USagCenters>). Evaluation data for research projects, feasibility studies and outreach initiatives are collected to record current work and lead future action.

Key Personnel

Name	Role	Phone	Email
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Learn more about the SW Ag Center faculty, staff, principal investigators and advisors at <http://www.swagcenter.org/aboutpeople.asp>.

Ag Center web link: www.swagcenter.org

- Facebook: www.facebook.com/swagcenter
- SW Ag Center YouTube Channel:
<https://www.youtube.com/channel/UCpjY-4XqieAKHwSioeBH-nQ>
- Ag Centers' Joint YouTube Channel:
<https://www.youtube.com/channel/UCRgk3ryTcY8Wcvvv ulZgmA>

SECTION II

Center Cores

Administrative and Planning Core

Center staff, principal investigators (PIs) and advisors convened three times in year 3 to discuss progress on research projects and cores and to consider emerging issues in agricultural occupational safety and health. A virtual Board Meeting was held in October 2013 and an in-person Board Meeting was held in Albuquerque in February 2014. During the Albuquerque meeting, the Center engaged in two field trips in order to learn more about New Mexico agriculture. Francisco Soto Mas, MD, PhD, an external advisor and feasibility study PI, led a tour of a small-scale organic farm that participated in his feasibility research study. Another external advisor, Robert Hagevoort, PhD, hosted the Center at a large herd dairy facility. Worker safety and health issues were explored and observed at both locations.

In September, the Center reconvened the PIs and advisors to have an open dialogue about emerging issues. Advisors informed the group about industry-specific trends and researchers from across the region discussed new project ideas. Ideas and priorities were recorded and will be used to inform future research and outreach.

Feasibility/Pilot Studies Program and Emerging Issues Core

The SW Ag Center staff engaged in face-to-face meetings with Sam Houston State University faculty, Texas A&M University at Commerce faculty and Agrilife Extension Agents to inform them of SW Ag Center goals and programs.

In year three, six projects were in process. Projects funded in September 2013 (1) examine tractor seating alternatives for operators with paraplegia; (2) capture work-life characteristics of South Texas agricultural workers through a clinic-based database; (3) identify and typify health and safety risks in NM organic farming; (4) measure the forces experienced by the body during grain entrapment; (5) determine whether youth development outcomes vary by their exposure to farm work; and (6) identify inflammatory agents in agricultural dust. A seventh project has been approved for funding and will start work on September 30, 2014. This project will determine the feasibility of an alternative method (sweat patches) of collecting pesticide exposure data from agricultural workers.

For more information, visit <http://www.swagcenter.org/opportunitiesfeasibilities.asp>. Contact Vanessa Casanova, PhD at 903-877-5896 or by email to Vanessa.Casanova@uthct.edu to schedule a presentation for your faculty.

Read more about past and current feasibility studies at <http://www.swagcenter.org/projectsfeasibility.asp>.

Outreach Program Core

Agricultural workers in the southwest region are particularly susceptible to heat illness. The SW Ag Center educated Agrilife Faculty from District 8 (South Texas) and Latino farmworkers from the Valley on Heat Illness Prevention. The SW Ag Center also presented information on heat illness to farmworkers and migrant education educators/administrators at the Migrant Education Conference in San Antonio. Over 400 bilingual FRESCO flipcharts, an r2p Center-developed product from a previous funding cycle, were distributed to migrant educators to help them teach farmworker families about heat illness prevention. http://www.swagcenter.org/Files/pdf/collage_fresco-12.pdf



The SW Ag Center partnered with the [Samuel Roberts Noble Foundation](#) to offer an Agricultural Safety Internship to help professionals gain knowledge and skills for a successful career in agricultural safety and health. In 2014, Ugochukwu Uzoeghelu, MBBS, CPH, MPH was selected as the intern. Ugochukwu (Ugo) recently completed his Master of Public Health degree with



a focus in Environmental and Occupational Health from the University of North Texas Health Science Center (UNT HSC). During the summer, Ugo lived in Ardmore, Oklahoma, and worked with Robert Williams, Safety and Risk Manager for the Noble Foundation. At Noble, Ugo got hands-on experience creating pesticide safety protocols, conducting farm audits and delivering job site safety presentations. The SW Ag Center connected Ugo to professionals who conduct research and outreach within occupational safety and health. Internship applications are accepted November-February;

<http://www.swagcenter.org/opportunitiesinternships.asp>

In September, Center staff met with representatives from logging associations in Arkansas, Louisiana and Texas, along with faculty from LSU Ag Center, to update, adapt and create new safety and health materials for logging continuing education. Priority topics and preferred delivery formats were identified. New resources will be available in spring 2015.

The SW Ag Center worked with the other nine Ag Centers to develop a joint YouTube channel, <http://www.youtube.com/user/USagCenters>. Now, extension agents, ag science teachers, producers, first responders and farm families have a one stop shop for agricultural safety and health videos. Our Center contributed by developing and managing the review process for videos to be approved for the site and providing feedback on the submission forms and site graphics. The site went live on November 1, 2013 and now includes 48 videos, including several videos produced by the SW Ag Center. The SW Ag Center Program Manager is currently leading and managing the YouTube working group.

Other resources available through the Center include:

- Educational Materials, <http://www.swagcenter.org/resourcesvideos.asp>
- Monthly Safety Blasts, <http://www.swagcenter.org/resourcesmonthlyblasts.asp>
- Cultivation Newsletters, <http://www.swagcenter.org/resourcesnewsletters.asp>

Contact Amanda Wickman at 903-877-5998 or by email to Amanda.Wickman@uthct.edu for more information on outreach activities and resources.

Evaluation Program Core

The evaluation program deployed two new and innovative evaluation instruments/tools for the collection of information for the SW Ag Center: a process evaluation form and a social network survey. The **process evaluation form** links proposed activities in a logic model with the actual activities that have been implemented. It enables research PIs and directors of administrative cores to readily track their progress



each quarter by indicating the status of each proposed activity as no progress, some progress, significant progress and completed, with detailed comments that explain the rating. As of September, 2014, the majority of activities in every project are either well underway (i.e., some or significant progress) or are on-schedule to begin as part of the intervention phase during the last quarter of 2014 or early 2015.

The **social network survey** was sent to 95 people from various organizations involved in some way with the SW Ag Center. Survey topics included a description of each respondent, their organization and partners/networks; types of partnerships (e.g., networking, coordinating, cooperating, and/or collaborating); type of assistance received from individuals and/or organizations listed in their network; and description of their organization's relationship with the SW Ag Center, types of assistance received, perception of SW Ag Center, and involvement with feasibility projects and mentoring others in AFF/occupational safety and health research.

For the social network analysis, these groups were formed from the responses: SW Ag Center, other Ag Center staff, ERC staff, university collaborators, community collaborators, NIOSH and other government collaborators. Interesting data on collaborative relationships include:

- 20% are at the level of collaboration, and 43% are *at **most** networking*
- SW Ag members work with an average of 20 people. The SW Ag Center Director and Program Manager work with a relatively large number of people.
- Individuals in government organizations have the greatest number of connections with individuals from other organizations, followed by those who are both Ag Center and University members.
- Of the total relationships, 66% developed within the last 4 years, and 45% developed within the last 2 years.
- Ag & University affiliated individuals tend to have the largest number of new relationships. The most highly collaborative individuals tend to be Ag & University affiliated. Several individuals who were both Ag & University affiliated appeared to be brokers in new relationships.

Research Projects

Poultry Dust Exposure and Lung Inflammation

PI: Vijay Boggaram, PhD

Host Institution: University of Texas Health Northeast

Exposure to the poultry house environment is a risk factor for the development of respiratory symptoms and lung diseases. Although the prevalence and severity of respiratory symptoms and lung diseases are higher among poultry workers compared to other agricultural workers, there is a lack of information on biological mechanisms

underlying disease development. To extend our results obtained using cell systems, we investigated the effects of exposure to poultry dust extract via intranasal inhalation on lung inflammatory responses in mice. Our preliminary data showed that at 24 h after exposure, protein concentration in lung lavage was increased indicating lung leakiness. The numbers of white blood cells in lung were increased. Lung levels of cytokines (KC, TNF- α and IL-6) increased after 1-5 h of exposure, but returned to control levels after 24 h. Collectively, our data indicate that poultry dust exposure increases pro-inflammatory cytokine levels and causes lung injury.

Neuromotor Function and Work Injury Risk Among Hispanic Adolescent Farmworkers

PI: Eva Shipp, PhD

Host Institution: Texas A&M School of Rural Public Health

Participants in this combined cross-sectional/cohort study are adolescents from the Texas-Mexico border who participate in migrant farm work at locations across the United States and a comparison group of their peers. The data collection schedule covers three migration seasons with pre- and post-migration assessments each season (project years 2-5). During the current reporting period (project year 3), data collection continued successfully as planned with community support. The post-migration data for season 1 was collected during the fall of 2013 and the pre-migration data for season 2 was collected in the spring of 2014. Assessments involved questionnaires to solicit information on demographics, migration and agricultural work patterns, work safety including a focus on pesticides/chemicals, injury, general health status, and health behaviors. Nurses measured height, weight, foot size, and blood pressure. Trained staff and nurses measured motor control primarily using postural sway assessment. All staff completed training/re-training in study procedures. For the season 1 post-migration data collection, 189 adolescents in grades 7-12 participated (response proportion= 75%). For the season 2 pre-migration data collection, 153 adolescents in grades 8-11 participated (response proportion= 81%). Approximately 48% of participants are female and 100% are Hispanic/Latino. Collaborators at the University of Cincinnati continue to monitor the postural sway assessment protocol (including a site visit) and to verify the accuracy of data processing. Findings indicate that the portable postural sway assessment protocol is appropriate for our study population. We also completed the development of a database to catalogue commonly used pesticides and their health effects by crop to help inform exposure categorization. Preliminary analysis of questionnaire and postural sway data is underway.



Intervention Project

Marketing Safety and Health Among Vietnamese Commercial Fishermen

PI: Ann Carruth, DSN, RN

Host Institution: Southeastern Louisiana University

This project establishes awareness and adoption of safety and health behaviors among Vietnamese commercial fishermen in the design and implementation of a socially marketed intervention campaign. Data from 339 Vietnamese shrimp fishermen indicate significant barriers to wearing personal flotation devices (PFDs) while working. As part of the design of prototype social marketing messaging, a pilot study is underway asking crews from 9 fishing vessels to wear three types of PFDs to examine work environment while wearing PFDs. Information regarding motivators will inform the development of campaign messaging.

Education Project

Education Approach to Increase Respirator Use Among Broiler Chicken Workers

PI: Matt Nonnenmann, PhD, CIH

Host Institution: The University of Iowa

The most impactful achievement so far is the engagement of several poultry production companies, producer associations and interaction with various chicken/broiler producers or “growers” to improve agricultural safety and health. Little is known about the knowledge or use of personal protective equipment among agricultural producers, in particular, chicken growers. To date, 62% of growers who responded to the questionnaire report using a respirator during work in the chicken house in the last seven days, with the majority of growers using a filtering face piece respirator. Lack of comfort was the most common reason growers chose not to wear a respirator. Growers also reported that among their daily tasks on the farm, removing dead birds was the dustiest job. Therefore, designing exposure interventions to reduce dust concentrations during tasks such as dead bird removal may result in reduced inhalation exposure to poultry dust.

An exposure intervention experiment was performed by modifying the daily task of dead bird removal to reduce dust exposure. The experiment resulted in a statistically significant reduction ($p=0.02$) in inhalable dust exposure. Specifically, when the dead bird removal task was performed in the “traditional” method, geometric mean inhalable dust exposure was $17 \pm 3 \text{ mg/m}^3$. While performing the “modified” mortality collection task, geometric



mean inhalable dust exposure was 13 ± 7.5 mg/m³. Additional research is underway exploring the effectiveness of engineering controls.

Both exposure and questionnaire data are currently being summarized and grower educational materials are being developed. Challenges remain with getting access to growers to provide information about occupational hazards in broiler production, effective approaches for reducing dust exposure and new respiratory protection technologies.